

# Safety Enforcement Education

Executive Summary



## City of Greensboro SafeLight Program

*Red Light Camera Program  
Review and Analysis*



Prepared for:



Prepared by:



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and Associates, Inc.



August 2004

# SafeLight

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## Executive Summary

Red light running has become an issue in the United States with over 250,000 annual crashes at intersections attributed to red light running resulting in nearly 900 fatalities per year. The City of Greensboro, along with other municipalities in North Carolina, had experienced the effects of decreased safety due to red light running and set out to specifically address this problem. In 1999, there were 498 traffic accidents in Greensboro attributed to red light running that resulted in 274 personal injuries. In 2000, the City of Greensboro established SafeLight, a red light photo enforcement program with three main objectives:

1. Enhance safety at signalized intersections in Greensboro by reducing the frequency and/or severity of crashes caused by red light running
2. Provide an additional method of violation enforcement so that police can use resources to fulfill other objectives
3. Raise awareness of safe driving practices in Greensboro

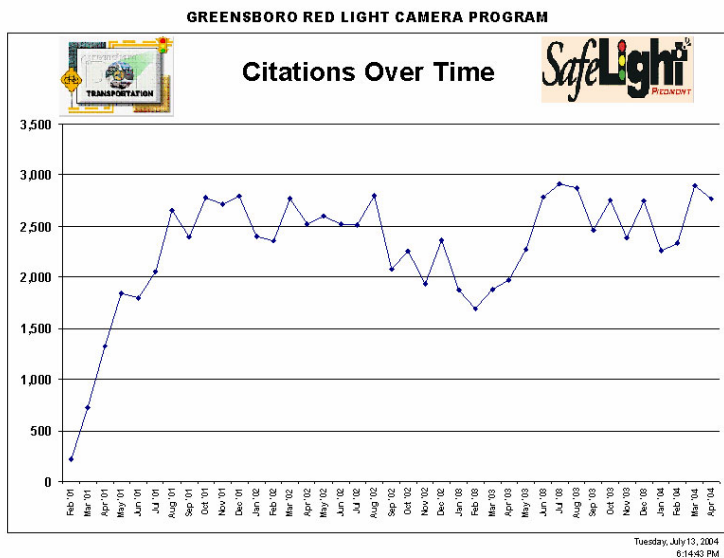
In October 2000, the City of Greensboro (the City) contracted with Peek Traffic Inc. to install and operate a red light photo enforcement system. In February 2001, Peek Traffic installed the first two automated red light cameras in the City of Greensboro. By November 2001, all 18 SafeLight cameras were operational and issuing red light running citations. With the exception of a few minor outages, the 18 cameras have been operational for nearly three years.

As the initial contract period between Greensboro and Peek Traffic drew to a close, the City contracted with Kimley-Horn and Associates, Inc. in early 2004 to perform a comprehensive program review of the SafeLight program and determine whether the program was meeting the City's objectives. The Greensboro program manager requested a program review and analysis that covered all aspects of the three objectives.

### Objective 1 – Enhance Safety

The first objective of Greensboro's SafeLight program is to enhance safety at signalized intersections by reducing the instances of red light running and number of crashes caused by red light running. Angle accidents are among the most severe types of crashes that can occur at an intersection. There are only two ways vehicles can be traveling in opposition through an intersection controlled by a traffic signal. One is if the signal has lost power and is not functioning. In this case, the intersection technically is not operating under signal control and should function as a multi-way stop. The other is if one vehicle has violated the signal and has entered the intersection on a red indication.

Red light cameras are installed at intersections for the purpose of identifying and ticketing drivers violating the law by entering intersections on a red indication. The cameras were installed to supplement or replace customary police surveillance. In Greensboro and other North Carolina municipalities, the fine for this violation is \$50 if cited by photo enforcement. Considered a civil offense with no points assessed to the driver or vehicle owner, the citation is issued to the registered vehicle owner according to DMV records based on the license tag number. In contrast, drivers ticketed for running a red light by a law enforcement officer in North Carolina are assessed a fine of \$125



(consisting of a \$25 penalty and \$100 court costs) and three points on their driver's license.

### Citation Summary

During the course of the program to-date, over 89,000 citations have been issued. Looking at numbers of citations issued each month in the graph of citations over time, the citation rates dipped the most between December 2002 and February 2003, although citations rose in the next several months in 2003. Summing citations annually and normalizing for the number of cameras and months each was active each year, average monthly citations declined 17% from 2001 to 2004.

Because enhanced safety is the first

objective of the SafeLight program, program managers expect the number of citations issued to decline over time as drivers begin to comply more often with the red indication. The greatest reductions in violations occurred during the first year of the program, which is likely a result of the public information campaign by the City and media attention during that first year. The average monthly citations issued in the first quarter of 2004 increased at most locations over the 2003 monthly averages.

### Crash Summary

The crash data used for the before-and-after study of the red light photo enforcement program in Greensboro was prepared by the North Carolina Department of Transportation from the Traffic Engineering Accident Analysis System (TEAAS). The installation dates of each of the cameras were provided by Peek Traffic. Because NCDOT prepared the crash analysis, the last available crash data from the Department of Motor Vehicles in TEAAS is through September 30, 2003. To create the longest study period possible, NCDOT analysts determined the length of the after period for each intersection to be the length of time between the end of the adjustment period and September 30, 2003. The before period mirrors the after period in length so that the before-and-after crash statistics can be compared. The average daily traffic (ADT) for the median year was used to generate rates for all years so they can be compared to each other.

Overall, 15 of the 18 intersections saw reductions, or improvements, in at least one measure of effectiveness from the before period to the after period. While the statistical significance of such results may be debated due to the small number of locations and the small number of crashes at each intersection, the total number of crashes at all 18

Site ID	Site Name	Total	Rate	Angle	Rearend	SI	EPDO
601	Holden & Spring Garden	-25%	-29%	-36%	-23%	19%	-10%
602	Wendover & English	4%	-2%	-20%	26%	-17%	-13%
603	Battleground & Brassfield	9%	2%	-16%	78%	37%	49%
604	High Point Rd. & Pinecroft	17%	10%	28%	23%	-15%	0%
605	Wendover & Church	55%	45%	53%	64%	0%	55%
606	Holden & Wendover	-20%	-25%	0%	-23%	21%	-3%
607	Randleman & Florida	-11%	-16%	-14%	14%	-41%	-48%
608	Randleman & Creek Ridge	-21%	-25%	-29%	12%	24%	-2%
609	Battleground & Pisgah Church	-37%	-40%	-70%	-30%	-33%	-58%
610	Holden & Pinecroft	80%	69%	100%	100%	313%	644%
611	High Point Rd. & Merritt	-34%	-34%	-35%	-33%	29%	-15%
612	Church & Cone	4%	-2%	33%	-8%	-9%	-5%
613	Battleground & Cone	37%	29%	40%	28%	-21%	7%
614	Wendover & Big Tree	-11%	-16%	-32%	-3%	-25%	-33%
615	Freeman Mill & Coliseum	-41%	-44%	-53%	-30%	-45%	-68%
616	Spring & Friendly	-24%	-28%	-15%	-75%	108%	58%
617	Wendover & Hill	48%	39%	-60%	63%	-1%	46%
618	Wendover & Bridford	6%	0%	18%	15%	3%	9%
<b>TOTAL</b>		<b>-4%</b>	<b>-14%</b>	<b>8%</b>	<b>2%</b>	<b>-2%</b>	

intersections went down by 4% from 776 to 745 with a standard deviation of 0.049, and the number of angle crashes – usually the more severe crash type – went down by 14% from 309 to 265 with a standard deviation of 0.071.



### Objective 1 Findings

*The first objective of enhancing safety has been achieved.* The analysis shows a 4% reduction in total crashes and a 14% reduction in angle crashes during the study period from an equivalent before period. The rates of citations issued for the total program decreased 17% from 2001 to April 2004, and several of the intersections saw significant reductions in citations from inception through December 2003.

## Objective 2 – Provide Additional Enforcement

The second objective of Greensboro's SafeLight program is to provide photo enforcement as an additional method of violation enforcement. The benefit to Greensboro Police Department (GPD) traffic enforcement officers would be that they could use their limited resources elsewhere to make the City safer. GPD likes the fact that the cameras are able to clearly record motorists who are breaking the law. In some cases, the police have used the camera images to identify hit and run vehicles.

GPD believes that the existence of the 18 red light running cameras in Greensboro aids the officers in monitoring approaches at intersections and enforcing traffic laws. To allow the GPD to benefit from the presence of photo enforcement, traffic enforcement officers as a practice do not monitor photo enforced intersection approaches for red light running violations. This allows these officers to focus more time on monitoring the other approaches at these intersections or at other intersections and monitoring for other types of violations.



In 2000, the year before the red light cameras were installed in Greensboro, GPD issued 1,446 red light running citations between January 1 and December 31. In 2003, the most recent calendar year in which all 18 cameras were operational, GPD issued 1,043 red light running citations. This is a decrease of 403 citations or a 28% reduction in citations issued from 2000 to 2003.

If an officer takes 10 minutes to issue a citation, as reported by the GPD, the 89,000 citations issued by the SafeLight Program since inception would have taken nearly 15,000 hours of officers' time. This would equate to 2-3 additional officers doing nothing but issuing red light running citations full time for 3 years. At a reported cost of \$21.13 per hour for a law enforcement officer's salary and benefits, it would have cost the city over \$300,000 to have officers issue the same number of citations as the cameras have over the program duration. Moreover, had the citations been issued by a law enforcement officer rather than through the SafeLight program, they would have carried points and a fine and court costs of \$125, which also would have resulted in additional costs to the citizens of Greensboro.



## Objective 2 Findings

*The second objective of providing additional enforcement has been achieved by contracting with Peek Traffic to install and maintain 18 red light cameras. The Greensboro Police Department reported they do not enforce red light running on photo enforced intersection approaches. This gives the Department time to focus on other locations and other moving violations.*

## Objective 3 – Raise Awareness

The third objective of Greensboro's SafeLight program is to raise awareness of safe driving practices in Greensboro. To evaluate the degree to which the program is meeting this objective, it is necessary to investigate the methods employed by the City to educate the public and how the program has been perceived in the media.

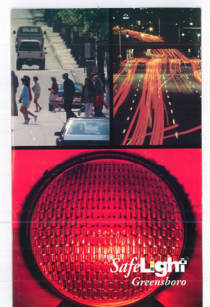
### Media Review Summary

Individual citizens and some elected officials have taken issue with red light photo enforcement programs across the country, and the media has aired or printed their viewpoints in several instances. A primary theme throughout several articles is the perception that government agencies are providing a mechanism for private companies to profit at the expense of its citizens and that the point of the programs is to generate revenue rather than to improve safety. Some imply that system operators have chosen locations and adjusted clearance times to maximize revenue. The right to due process, violation of privacy, the presumption of guilt, and the fining of vehicle owners without proof of driver identification are other themes seen in news articles critical of photo enforcement programs. Articles portraying the benefits of red light camera programs report the reduction in crashes and decrease in citations issued. Articles also report what other safety improvements have benefited the community with revenues from the paid citations. Many, if not all, systems have been portrayed positively and negatively by the media at one time or another. In the Triad region, many news reports have centered on the issues raised by the High Point lawsuit.

### Program Outreach Summary

Before the first camera was installed, the City of Greensboro had begun a planned outreach campaign to educate the citizens about the SafeLight program. The campaign focused on reaching the public through the media and through direct contact.

The City issued press releases that introduced the SafeLight program and then issued a press release when each red light camera was turned on. Many local media outlets picked up on the press releases and reported on the SafeLight program status. In addition, the City used its own community access Channel 13 to reach the public. In cooperation with the SafeLight Charlotte program, a fifteen minute video was produced that explained the SafeLight program and its operations. In 2002, as the cameras were being installed, this video was shown eight times a day on Channel 13 for about six months. The City also went directly to the citizens to educate them on the SafeLight program. A flyer explaining the program was distributed with water bills mailed to citizens in 2002 reaching nearly 90,000 Greensboro residents. In addition, the program provided about 5,000 SafeLight brochures, 10,000 SafeLight bumper stickers, and 10,000 children's flashing Safelight buttons for



distribution to Greensboro citizens. Finally, City staff met with the public at 25 civic group meetings to give a presentation on the SafeLight program and at “City Hall in the Mall” events.

### **Objective 3 Findings**

*The City has met the third objective of raising awareness of safe driving practices by actively participating in marketing the program.* The City has distributed several types of marketing materials for the SafeLight program and has been open and cooperative with the media regarding the program. In addition, funds from SafeLight have gone toward other safe driving programs in Greensboro.

## **Program Compliance with State and Local Laws**

The operation of Greensboro’s SafeLight program is fully compliant with state and local laws. In fact, the program has extended the payment window for citations beyond the period stated in the Greensboro ordinance. In January 2003 the City made a policy decision to extend the period for an individual to pay or appeal a citation from 21 to 28 days. The purpose of this change was to be more consistent with other City payment processes and hopefully increase the collection rate for penalties.

The North Carolina General Statute allowing the operation of red light cameras requires that the clearance intervals be calculated by methods that are contained in the Design Manual published by the Signals and Geometric Section of NCDOT. The yellow change and red clearance intervals are used in traffic signals to allow motorists approaching the intersection to have sufficient time to clear the intersection at the termination of the green before displaying a green indication to the conflicting traffic. The amount of time given is a function of the posted or average speed, the grade of the approach, and the width of the intersection that vehicles must traverse. The yellow change and red clearance intervals at the 18 SafeLight intersections comply with the NCDOT guidelines.

## **Program Compliance with Federal Guidelines**

In 2003, the Federal Highway Administration (FHWA) published a report on red light cameras titled, *Guidance for Using Red Light Cameras*. The report was in response to the rapid deployment of red light photo enforcement programs in the United States and the often inconsistent implementation of these programs. The FHWA presented proven and effective practices to provide guidance in addressing red light runners and how to implement a red light photo enforcement program if deemed beneficial.

The guidelines were published by the FHWA two years after Greensboro had its first red light camera installed and operational. Nevertheless, Greensboro’s red light photo enforcement program adheres to the majority of the guidelines. One area where the Greensboro program differs from the FHWA guidelines is system procurement and contracting. The FHWA report suggests that when a private contractor is responsible for processing citations, the contractor’s compensation should not be based on the number of citations issued (i.e., receiving a percentage of the citation fines). The FHWA believes this type of payment arrangement to be a conflict of interest with the potential for impairing the contractor’s judgment regarding installation and operation of the red light camera system. The City has addressed this concern by reducing the per citation

payment as the number of citations increases, which limits the contractor's proceeds, and by having a system of checks and balances limiting independent decisions made by the contractor about system operations.

## Program Financial Review

According to the City, the revenue collected from the more than 89,000 citations issued during the three-year SafeLight program has exceeded \$3.4 million. During this time, Greensboro paid Peek Traffic approximately \$2.3 million to operate the program according to the payment schedule in the contract. Greensboro spent nearly \$150,000 on adjudication for those who appealed the citations and paid over \$8,000 to the Department of Motor Vehicles to allow Peek Traffic to access vehicle registration records.

With the remaining funds from the citations, the City has financed safety programs. The City helped to fund the Neighborhood Speed Watch and Pace Car program. These safety programs attempt to lower speeds in the City through various initiatives.

Specifically, some of the photo enforcement revenues were spent purchasing radar/display units for citizens to use in their neighborhoods to help combat speeding. The City also purchased 30 portable generators to power traffic signals during power outages that can occur due to storm events. Providing temporary power to signals in critical areas will help maintain order and minimize congestion and crashes during prolonged power outages. The City currently retains a balance of over \$900,000 that will be used to fund safety improvements.

To operate photo enforcement systems, contractors are generally paid either on a lump sum or per-citation basis. Lump sum payments reduce the perception that systems are designed to maximize citations and revenue but per-citation payments ensure the system is well maintained and operating effectively by tying the revenue to issuance of citations.

In Greensboro, which has a per-citation payment contract, the City selected the sites and set the clearance times. The system includes a 0.2-second grace period after the light changes from yellow to red before a violation is considered to have occurred. Finally, the percentage of payment to the contractor from each citation decreases as the number of citations increases. The contractor has little ability or incentive to make changes to increase the numbers of valid citations issued.

City of Greensboro  
RED LIGHT CAMERA PROGRAM  
4915 Piedmont Parkway, Suite 108, Jamestown, NC 27282  
(336) 834-9555

**SafeLight**  
Piedmont

MAIL DATE: [REDACTED]  
Payment Due Date: 07/26/2004  
If paid after due date

**NOTICE OF CITATION**  
Citation Number 633885  
Amount Due: \$50.00  
Amount Paid: \$100.00

Internet Password: [REDACTED]  
Amount Paid: \$

Greensboro, NC 27401

Contact us on the Internet for citation information and payments at:  
<https://onlineviolation.com/greensboronc>

City of Greensboro  
4915 Piedmont Parkway, Suite 108  
Jamestown, NC 27282

Citation Number: 633885  
Plate: [REDACTED]

On 06/23/2004 at 12:59 PM your vehicle was photographed (copies are shown to the right) entering an intersection in which the traffic signal was red, in violation of Greensboro City Code Section 16.58. The civil penalty for this violation is \$50.00. No points will be assessed against your driving record or insurance as a result of this violation. Please see reverse side for payment options and for a description of the information in the Data Block shown above the photographs.

This program has been initiated to increase roadway safety, reduce red light violations and prevent injuries. If you have any questions regarding this citation, please visit our Internet site or call the office at (336) 834-9555.


**Important Notice:** Failure to pay the civil fine by the due date shown above will result in an additional late penalty of \$50.00. Request for appeals and transfer of responsibility must also be received by the due date above or your right to appeal will be waived. For your convenience, you may pay or appeal your citation via the internet at <https://onlineviolation.com/greensboronc>. Please be sure to use the internet password provided above to access your citation.

Amber Time	Red Time	Vehicle Tag No
4.00	.20	[REDACTED]

Date/Time	Location of Violation
06/23/2004 12:59 PM	BATTLEGROUND AND CONE

**FOR A SAFER COMMUNITY  
STOP ON RED**

07/30/2004 Reprint



## Conclusions and Recommendations

Currently, the SafeLight program has been operational for three years and the City is considering renewing the contract to provide red light photo enforcement in Greensboro. The City is meeting the objectives it set for the program to date. Based on the findings in this report, the following items are recommendations for the City to consider as they enter the next phase of the SafeLight program.

- When renewing the contract with the red light camera provider, consider a lump sum payment schedule rather than a per-citation payment schedule. This may eliminate perceptions that the SafeLight program has the sole purpose of generating revenue.
- Revisit the selection of intersections with red light cameras. Locations where crashes and red light violations are not decreasing do not meet the first objective of the program and may be more suited for alternate engineering or enforcement countermeasures to enhance safety. Also, consider using updated crash statistics and solicit input from the Police Department to identify potential new locations for red light cameras.
- Continue to invest in program outreach to educate the public about the SafeLight program. The program could target new drivers through presentations at high schools and driver education classes. The program could provide annual reports that highlight the benefits of the program and the benefits of the revenue that is generated. Finally, Greensboro staff should work with local media to publicize the benefits of the system.